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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,172	09/16/2003	Bruce C. Beihoff	ALBR0129?YOD 03AB109	2821
7590 Alexander Gerasimow Allen Bradley Company Patent Dept. 704P Floor 8 T29 1201 South Second Street Milwaukee, WI 53204			EXAMINER NGUYEN, HOA CAO	
			ART UNIT 2841	PAPER NUMBER
			MAIL DATE 10/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/663,172	BEIHOFF ET AL.	
	Examiner	Art Unit	
	Hoa C. Nguyen	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-77 is/are pending in the application.
- 4a) Of the above claim(s) 52-55, 57, 62-65, 67, 72-75 and 77 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 48-51, 56, 58-61, 66, 68-71, and 76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election without traverse of Species 3 (the structures shown in figures 8, 25, 26, and 32B), in which claims 48-51, 56, 58-61, 66, 68-71, and 76 correspond to this elected Species, in the reply filed on 7/5/07 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 49, 50, and 51 recite the limitation "... wherein the at least one connector ..." in the claim. There is insufficient antecedent basis for this limitation in the claim.

The claims are dependent claims of claim 48. In the independent claim, the only connector is mentioned in the claim is the "at least one plug-in connector".

For continuing examination, the Examiner assumes the "the at least one connector" is indeed the "the at least one plug-in connector".

4. Claims 59, 60, and 61 recite the limitation "... the at least one connector ..." in the claim. There is insufficient antecedent basis for this limitation in the claim. The claims are dependent claims of claim 58. In the independent claim, the only connector is mentioned is the "at least one plug-in connector".

For continuing examination, the Examiner assumes the "the at least one connector" is indeed the "the at least one plug-in connector".

5. Claims 69, 70, and 71 recite the limitation "... the at least one connector ..." in the claim. There is insufficient antecedent basis for this limitation in the claim. The claims

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are dependent claims of claim 68. In the independent claim, the only connector is mentioned is the "at least one plug-in connector".

For continuing examination, the Examiner assumes the "the at least one connector" is indeed the "the at least one plug-in connector".

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 51, 61, and 71 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

(a) Claim 51: The claim recites "the at least one plug-in connector includes connections for in coming and outgoing cooling fluid".

As can be seen in figure 8, the "at least one plug-in connector coupled to the switching circuit and to the housing for establishing electrical continuity between the converter and external circuitry" is shown on the right side of the housing 94.

As can be seen in figures 25, 26, and 32B, the "at least one plug-in connector coupled to the switching circuit and to the housing for establishing electrical continuity between the converter and external circuitry" is shown as 100 containing five conductors 106/108 surrounded by a shielding member (a flange).

The Examiner is confused by "the at least one plug-in connector includes connections for in coming and outgoing cooling fluid" that can satisfy the limitation "coupled to the switching circuit 14/16 and to the housing 94 for establishing electrical continuity between the converter and external circuitry of claim 48. Figures 25, 26, and 32B show coolant outlets 22 and 24 formed on the rear side of the interface plate 258. Does "the at least one plug-in connector includes connections for in coming and outgoing cooling fluid" means the interface plate 258? The interface plate 258 is not described in the specification as a connector.

Because of the confusion by the limitation, the claim is not considered in this Office action.

Examiner remarks: Applicants should be noted that the references 106 and 108 are also referred as connectors (see paragraph 90 in US 2004/0066643, the publication of this application).

(b) Claims 61 and 71: The claims are also rejected under 35 U.S.C. 112, first paragraph by the same reason as discussed in the above paragraph and are therefore not considered in this Office action.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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9. Claims 48 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Baumel et al. (US 5966291, hereafter Baumel).

Regarding claim 48, as shown in figures 1 and 2, Baumel discloses a modular power converter comprising:

(a) a converter (see col.2:59-62, as clearly shown in figure 1) including a support 21 (heat sink, col.3:10-12) including a passage 211 (provided by ribs 211, col.3:15-16) for circulation of a cooling medium 23 (col.3:21-22) and a power electronic switching circuit 1 (power unit, col.2:64) mounted on the support 21 and inherently configured to convert input power to output power having desired electrical characteristics;

(b) a housing 61 (col.3:66-col.4:1) at least partially surrounding the converter;
and

(c) at least one plug-in connector 52/53/54 (col.3:64, considering the connecting bars 52/53/54 for plug in external cables/wires) coupled to the switching circuit and to the housing for establishing electrical continuity between the converter and external circuitry.

Examiner remarks:

Applicant should be noted that the limitation "configured to convert input power to output power having desired electrical characteristics" is interpreted to only require the ability to so perform. In the case of product claim, only the structure of the claim distinguishes over the prior art.

Applicant also noted that connecting bars could be used to plug in a cable for connecting to external circuit.

Regarding claim 56, Baumel further discloses a fluid connector 221/222 (col.3:19; considering the inlet/outlet opening as fluid connector) for routing the cooling medium to and from the converter.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 49-50, 58-60 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumel.

Regarding claim 49, Baumel disclose every limitation as shown in claim 48 above including the at least one plug-in connector extends shielding from the housing to a region at least partially surrounding conductors of the at least one connector. But, Baumel does not disclose the housing shields the switching circuit from EMI, and wherein the at least one connector extends EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector.

It is old and well known in the art that metal housing can provide EMI protection and a housing made of metal is also well known in the art.

The Examiner takes Official Notice that metal housing is well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the housing 61 of Baumel to be made of metal in order to provide chassis grounding/common grounding for power unit 1 and the

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control unit 3 enclosed within the housing. Thus, resulting the housing 61 shields the switching circuit from EMI, and the at least one connector extends EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector.

Regarding claim 50, Baumel discloses every limitation as shown in claim 48 above, but fails to disclose the at least one plug-in connector includes a single connector having electrical connections for the input power and the output power.

A plug-in connector contains multiple of pins/leads for both input and output is old and well known in the art. It is merely a matter of choice to separate them in different connectors or combining all in a single connector.

The Examiner takes Official Notice that a plug-in connector that includes a single connector having electrical connections for the input power and the output power is old and well known.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the plug-in connector of Baumel as a single connector having electrical connections for the input power and the output power, Since this feature is well known in the art.

Regarding claim 58, Baumel discloses every limitation as shown in claims 48 and 49 above including:

(a) a converter (power unit 1 and control unit 3) including a support 21 including a passage 211 for circulation of a cooling medium 23 and a power electronic switching

circuit 1 mounted on the support and configured to convert input power to output power having desired electrical characteristics;

(b) a housing 61 at least partially surrounding the converter; and

(c) at least one plug-in connector 52/53/54 coupled to the switching circuit and to the housing for establishing electrical continuity between the converter and external circuitry (inherent).

However, Baumel fails to disclose the housing configured to provide integral EMI shielding and at least partially defining an electrical reference plane for the converter, and the at least one plug-in connector coupled to the switching circuit and to the housing for extending EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector.

As discussed in claim 49 above about the metal housing that can also provides EMI protection and common grounding, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the housing 61 of Baumel to be made of metal material in order to provide chassis grounding/common grounding for power unit 1 and the control unit 3 enclosed within the housing. Thus, resulting the housing that provide integral EMI shielding and at least partially defining an electrical reference plane (chassis grounding) for the converter, and the at least one plug-in connector coupled to the switching circuit and to the housing for extending EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector (the conductors are partially enclosed within the metal housing).

Examiner Remarks: The limitation that the housing configured to provide integral EMI shielding for the converter and the at least one plug-in connector coupled to the switching circuit for establishing electrical continuity between the converter and external circuitry (trivial) and for extending EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector are interpreted to only require the ability to so perform. In the case of product claim, only the structure of the claim distinguishes over the prior art.

Regarding claim 59, the limitation that the housing and the at least one plug-in connector are configured to provide contiguous shielding having intrinsically low impedance paths for EMI originating from the switching circuit and from sources external to the converter during operation are interpreted to only require the ability to so perform. In the case of product claim, only **the structure** of the claim distinguishes over the prior art.

Regarding claim 60, Baumel does not disclose every the at least one plug-in connector includes a single connector having electrical connections for the input power and the output power.

As discussed in claim 50 above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the plug-in connector of Baumel as a single connector having electrical connections for the input power and the output power, since this feature is well known in the art.

Regarding claim 66, Baumel discloses a fluid connector 221/222 for routing the cooling medium to and from the converter.

12. Claims 68-70, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumel in view of Nagafuji (US 5938450).

Regarding claim 68, Baumel discloses every limitation as shown in the above claims including

(a) a converter including a support 21 including a passage 211 for circulation of a cooling medium 23 and a power electronic switching circuit 1 mounted on the support and configured to convert input power to output power having desired electrical characteristics (see claim 48 above);

(b) a housing 61 at least partially surrounding the converter and configured to provide integral EMI shielding and at least partially defining an electrical reference plane for the converter (see claim 58 above);

(c) at least one plug-in connector 52/53/54 coupled to the switching circuit and to the housing; and

(d) inherently a connector plug (not shown, but there must be a connector -a female connector - connected to the connector 52/53/54) adapted to interface with the at least one plug-in connector for establishing electrical continuity between the converter and external circuitry.

However, Baumel fails to disclose the at least one plug-in connector (male connector) and the connector plug (female connector) mate to extend EMI shielding from the housing to the connector plug.

As shown in figures 8A and column 8, lines 27-40, Nagafuji disclose a pair of male and female connector 49/48 each has a metal housing to avoid EMI.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the at least one plug-in connector (a male connector) and the connector plug (a female connector) mate to extend EMI shielding from the housing to the connector plug as taught by Nagafuji in order to avoid EMI, thus providing the at least one plug-in connector and the connector plug mate to extend EMI shielding from the housing to the connector plug.

Examiner remarks: The limitation that adapted to interface with the at least one plug-in connector for establishing electrical continuity between the converter and external circuitry is interpreted to only require the ability to so perform. In the case of product claim, only the structure of the claim distinguishes over the prior art.

Regarding claim 69, The limitation that the housing, the at least one connector and the connector plug are configured to provide contiguous shielding having intrinsically low impedance paths for EMI originating from the switching circuit and from sources external to the converter during operation is interpreted to only require the ability to so perform. In the case of product claim, only the structure of the claim distinguishes over the prior art.

Regarding claim 70, As discussed in claim 50 above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the plug-in connector of Baumel as a single connector having electrical

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connections for the input power and the output power, since this feature is well known in the art.

Regarding claim 76, Baumel discloses a fluid connector 221/222 for routing the cooling medium to and from the converter.

Citation of Relevant Art

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Ikeda (US 20010012212) discloses a Motor driving inverter.

Yamane (US 6573616) discloses a Cooling structure for a vehicle control unit.

Tareilus (US 6326761) discloses a Power electronics device for controlling an electric machine.

Hecht et al. (US 5485350) disclose a Cooled electronic housing.

Hoshino et al. (US 6629859) discloses Shielded connector assembly.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa C. Nguyen whose telephone number is 571-272-8293. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Hoa C. Nguyen

TUAN T. DINH
PRIMARY EXAMINER

9/28/07